OF INVESTIGATION 31

STATE OF ILLINOIS
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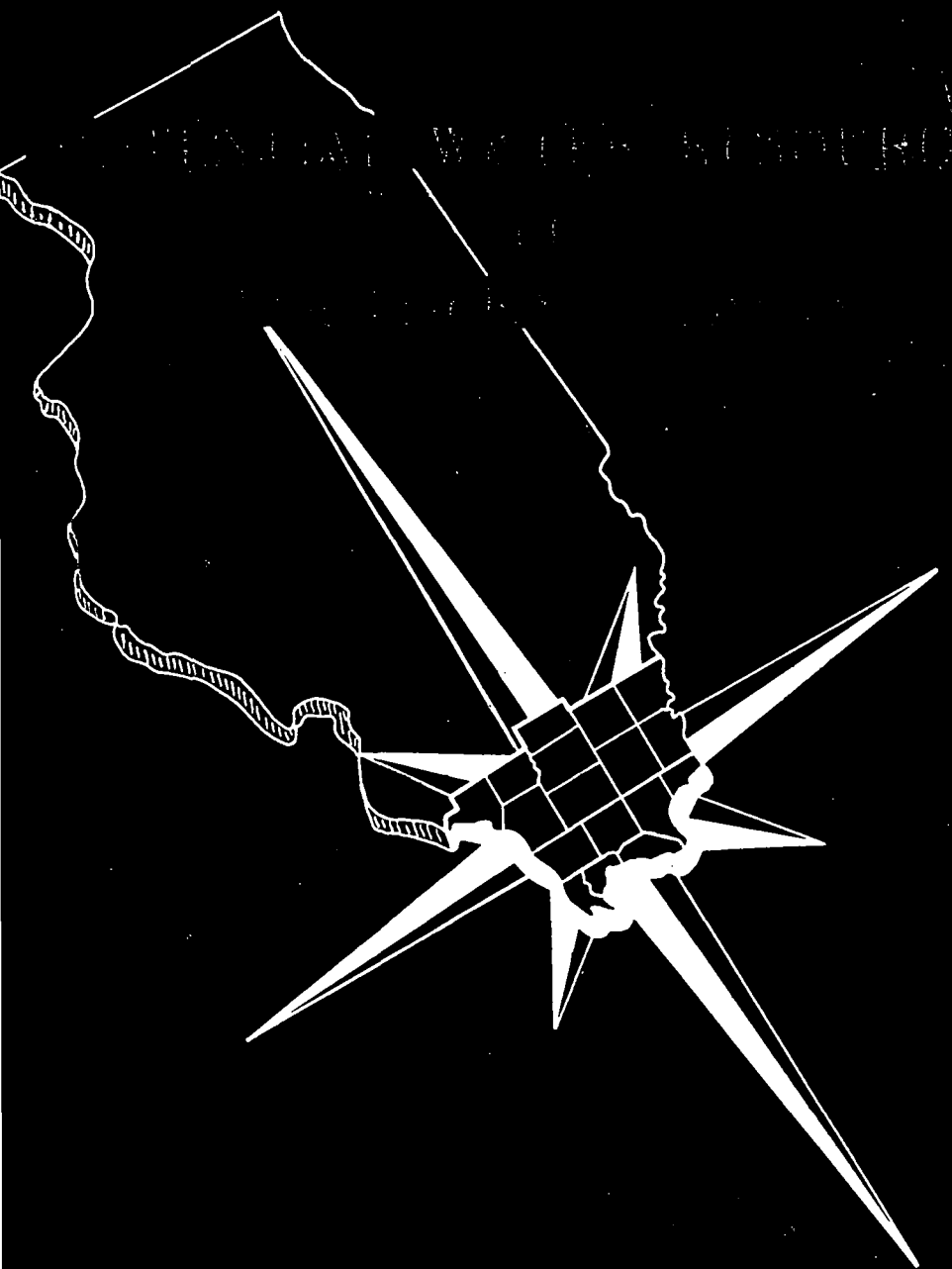

ILLINOIS STATE WATER SURVEY
WILLIAM C. ACKERMANN, Chief

URBANA
1957

MUNICIPAL SUPPLIES FROM STREAMS

Present Sources

Although the region has 30 municipalities that depend upon wells for their water supplies, the larger communities have impounding reservoirs or use Crab Orchard Lake for part of their demands. There are 32 surface-water using communities in the 17 counties of which 27 are municipally owned and 5 are operated by private companies. Of these 32 communities, 7 obtain water from rivers or lakes; 4 from channel dams; 2 from side-channel storage; 13 from impounding reservoirs and 6 from impounding reservoirs with a supplemental surface water source.

Rivers

The 7 communities obtaining water supplies from rivers are as follows. All of these systems are municipally owned and operated except Cairo's plant which is privately owned.

Evansville, Randolph County, takes its water from the Kaskaskia River. The plant was installed in 1943 and the population of the town is 821. The daily pumpage is estimated to be 40,000 gallons per day. The village supplies the International Shoe Company plant and the Sauer's Flour Mill.

Chester, Randolph County, obtains its water from the Mississippi River. The system was installed in 1902 and the population of the town is 5389. The average pumpage is 350,000 gpd. In November 1948, work was begun to improve the water quality, and in 1950 a new water treatment plant was put into operation.

Cairo, Alexander County, obtains its municipal water supply from the Ohio River. The first water works was installed in 1887 and the population is 12,100. Pumpage averages 3 million gallons per day.

Thebes, Alexander County, takes its municipal water supply from the Mississippi River. The plant was installed in 1929 and pumpage averages 20,000 gallons per day. The population is 541.

Rosiclare, Hardin County, takes its water from the Ohio River. The plant was installed in 1935 and in 1937 water was supplied to Elizabethtown from the Rosiclare system. The average daily pumpage is 150,000 gallons for a population of 2086 in Rosiclare and 583 in Elizabethtown.

Golconda, Pope County, takes its water supply from the Ohio River. The average pumpage is 75,000 gpd for a population of 1066 inhabitants. The present system was installed in 1935. Prior to that the city had drilled three wells in 1930 but none of the wells was successful and all were abandoned.

Carmi, White County, pumps 300,000 gpd of Little Wabash River water. The system was installed in 1894 and the population is 5574.

Channel Dams

Four of the municipal systems obtain water from channel dams as follows. Pinckneyville and Zeigler are municipally owned and operated systems. The Murphysboro and Royalton plants are privately owned.

Pinckneyville, Perry County, obtains water from Beaucoup Creek. The system was installed in 1883 and the present pumpage is 250,000 gpd. The population of Pinckneyville is 3299.

Murphysboro, Jackson County, pumps 375,000 gpd of Big Muddy River water. This system was installed in 1889 and the population is 9241.

Royalton, Franklin County, pumps 150,000 gpd of Big Muddy River water. The system was installed in 1926 and the population is 1506.

Zeigler, Franklin County, obtains water from a tributary of Big Muddy River. Average pumpage is 150,000 gpd for a population of 2516. The system was originally installed in 1903.

Side-Channel Reservoirs

Carrier Mills, Saline County, pumps water from South Fork of the Saline River into a side-channel reservoir. Pumpage is 65,000 gpd and the population is 2252. The system was installed in in 1938 and is owned by the municipality.

Galatia, Saline County, has a side-channel reservoir near Gassaway Creek. Pumpage is 40,000 gpd and the population is 933. This municipally owned system was installed in 1937.

Impounding Reservoirs

Thirteen of the communities have water systems which make use of impounding reservoirs.

Mt. Vernon, Jefferson County, has two reservoirs on branches of Casey Fork. This is a privately owned company and pumpage is 1.5 million gallons per day. The population of Mt. Vernon is 15,600 and the waterworks was installed in 1891.

Coulterville, Randolph County, has an impounding reservoir on a tributary of Mud Creek. Pumpage averages 70,000 gpd and the system was installed in 1942. The population is 1160. This is a municipally owned plant.

Sparta, Randolph County, has an impounding reservoir on a branch of Mary's River. The pumpage average is 193,000 gpd. This is a municipally operated system and was installed in 1889. The population of Sparta is 3576.

DuQuoin, Perry County, has an impounding reservoir on Reese Creek. Pumpage averages 800,000 gpd and the system was installed in 1898. The population is 7147. This is a municipally owned system. Tamaroa receives water from DuQuoin.

Sesser, Franklin County, obtains water from an impounding reservoir on Sandusky Creek. Pumpage averages 250,000 gpd. The system was installed in 1924 and the population is 2096. This is a municipally owned system.

Christopher, Franklin County, obtains water from an impounding reservoir on Brandy Creek. Pumpage averages 400,000 gpd and the population is 3545. This municipally owned system was installed in 1916.

McLeansboro, Hamilton County, has an impounding reservoir on a branch of Big Creek. Pumpage averages 225,000 gpd and the population is 3008. This municipally owned system was installed in 1900.

Norris City, White County, has an impounding reservoir on Indian Creek. Pumpage averages 70,000 gpd and the population is 1370. This municipally owned system was installed in 1937

Carbondale, Jackson County, has an impounding reservoir on Piles Fork, however most of the city's water supply is pumped from Crab Orchard Lake. The present pumpage is 1.4 million gallons per day and the 1950 population was recorded as 10,921. This is a municipally owned system, installed in 1897.

Johnston City, Williamson County, has an impounding reservoir on Lake Creek. Pumpage averages 100,000 gpd. The system is municipally owned and was installed in 1908. The population is 4429.

Eldorado, Saline County, has an impounding reservoir on Wolf Creek. This is a privately owned water system installed in 1920. Pumpage is 240,000 gpd and the population is 4500. Raleigh receives water from Eldorado.

Vienna, Johnson County, has an impounding reservoir on McCorkle Creek. This is a municipally owned system installed in 1937. The present pumpage is 60,000 gpd and the population is 1085.

Elkville, Jackson County, has an impounding reservoir named Hallidayboro Lake. The pumpage averages 55,000 gpd. This is a municipally owned system installed in 1937. The population is 934.

Supplementary Surface Sources

Benton, Franklin County, has an impounding reservoir on a branch of Big Muddy River. This municipally owned system was installed in 1911. The present pumpage is 730,000 gpd and the population is 7848. During the 1952-55 drought, Benton laid a pipe line from the lake to the Big Muddy River and pumped water from the river for a period.

West Frankfort, Franklin County, has two impounding reservoirs. One on Tilley Creek was installed in 1917, and a second on Stevens Creek was installed in 1945. The population is 11,384 and the pumpage is 700,000 gpd. As an emergency measure during the drought, a low dam was constructed across a branch of Big Muddy River and plans made to pump directly into the 16-inch main between the lakes and the water plant. No appreciable quantity of water was pumped from this source.

Herrin, Williamson County, has an impounding reservoir on Wolf Creek and also receives water from Crab Orchard Lake. The present pumpage is 875,000 gpd and the population is 9331. This is a municipally owned system installed in 1911.

Marion, Williamson County, has an impounding reservoir on a branch of Craborchard Creek. In 1952 this source became inadequate and a pipe line was laid to Crab Orchard Lake. Water is pumped from Crab Orchard Lake to the impounding reservoir and thence to Marion. Pumpage averages 625,000 gpd and the population is 10,459. This is a municipally owned system installed in 1904.

Cartersville, Williamson County, has an impounding reservoir on Hurricane Creek. In 1955 when its reservoir became nearly dry, Carterville completed a pipe line to Crab Orchard Lake The present pumpage is 175,000 gpd and the population, 2716. This is a municipally owned system installed in 1924.

Harrisburg, Saline County, has several side-channel impoundments including a new one north of town on the Middle Fork of the Saline River. The present pumpage is 825,000 gpd and the population is 10,999. This is a municipal system installed in 1901.

Data on these water supplies are presented in Table 40, Water Quality section of this report.

Crab Orchard Lake

The most significant water resource development in southern Illinois is Crab Orchard Lake and its tributary lakes, Little Grassy and Devils Kitchen. Work on completion of Devils Kitchen Lake is now progressing. Crab Orchard is the largest artificial lake in Illinois and was constructed in the late 1930's for recreational and water supply uses. The major portion of Crab Orchard Lake watershed is in Williamson County, but it extends southward into Union and Johnson Counties and westward to Jackson County. Excluding the lake areas, the watershed has an area of 185 square miles. The earth-fill dam, 3000 feet in length, extends in a north-south direction in the SW 1/4 of Section 19 to the NW 1/4 of Section 30, T9S, R1E in Williamson County. The dam has a maximum elevation of 50 feet above the former Craborchard Creek stream bed. Mean sea level elevation of the top of the dam is 415 feet and that of the spillway, located on the south end of the dam, 405 feet. The lake extends in an easterly direction for about nine miles from the dam. Its width varies from one-half mile to one and one-half miles. The lake has two northward extending arms about two miles upstream from the dam and another major arm extends in a southerly direction about six miles upstream from the dam. Water from Little Grassy

SALINE COUNTY

A dam site on Gassaway Creek located in the NE 1/4 of Section 2, T8S, R5E, 1-1/2 miles northwest of Galatia, would create a 260-acre lake. The storage capacity would be 2340 acre-feet and the watershed area 4.1 square miles. No township roads would be affected by this site.

A large shallow lake could be formed on the South Fork of the Saline River by constructing a dam in the NE 1/4 of Section 19, T10S, R5E. With spillway crest elevation at 400 feet, the pool area would cover 3140 acres and impound 21,000 acre-feet. The watershed area is over 150 square miles. Although it would create considerable storage, the lake would affect the Illinois Central Railroad which presently runs through the center of the site. Only one short stretch of improved county highway would be affected but having the large watershed may create a silt problem on this lake. However, there are many sites upstream that could be developed as smaller reservoirs.

The Battle Ford Creek site was considered many years ago by the State of Illinois as a conservation lake. The dam would be located in the SW 1/4 of Section 28, T10S, R6E. The spillway elevation would be at 460 feet, creating a lake with a pool area of 510 acres. The storage capacity is estimated at over 15,300 acre-feet and the watershed area would be 9.3 square miles. One unimproved county road would need to be abandoned. In addition an improved county road would need to be relocated around the head of the lake.

A large lake site exists in the valley of Little Saline River. If the dam were located in the SE 1/4 of Section 34, T10S, R5E, a lake with a pool area of 3300 acres would be developed. The storage capacity is estimated at over 120,000 acre-feet, and the watershed area would be 26.9 square miles. The maximum depth of this reservoir would be 110 feet, assuming spillway crest elevation at 460 feet. This site would require relocation of two township roads and abandonment of roads in the valley floor. In addition the Illinois Central Railroad (Edgewood cutoff) passes through the upper part of the reservoir and may need to be raised to be above maximum lake height. Highway 45 passes within one mile of the headwaters of this site in Johnson County.

A site exists on Blackman Creek near Highway 44, approximately eight miles south of Harrisburg for a reservoir with a dam near the NE corner of Section 27, T10S, R6E. With spillway elevation at 430 feet, the pool area would be 270 acres and the storage capacity 4860 acre-feet. The watershed area is 3.9 square miles. No roads would be affected.

Spring Valley Creek or Beech Hollow provides a reservoir site with a dam near the south line of Section 24, T10S, R6E. With spillway elevation at 440 feet, the lake would cover an area of 290 acres and have a storage capacity of 5800 acre-feet. The watershed area is 4.7 square miles. One improved township road and one unimproved road would be affected by this reservoir.

A small lake could be constructed in Lockwood Hollow with a dam located in the SW 1/4 of Section 19, T10S, R7E. With spillway elevation at 420 feet, the pool area would be 20 acres and the storage capacity 270 acre-feet. The watershed area is 0.9 square mile. No roads would be affected.

A dam could be constructed in Sadler School Hollow in the SE 1/4 of Section 19, T10S, R7E. With spillway elevation at 460 feet, the pool area would be 38 acres and the storage capacity 760 acre-feet. The watershed area would be 1.3 square miles.

A dam could be constructed in the valley of Flat Rock Hollow in the NW 1/4 of Section 20, T10S, R7E. With spillway crest elevation at 460 feet, the lake would have an area of 100 acres and a storage capacity of 2000 acre-feet. The watershed area would be 1.6 square miles. The township roads in this area would not be affected.

A lake could be constructed in the valley of Eagle Creek, with dam located in the SW 1/4 of Section 7, T10S, R8E. The dam site is located in Gallatin County and data on the lake are tabulated in the Gallatin County section of this report.

If a dam were constructed in Horseshoe Hollow, three miles southwest of Equality, in the NE 1/4 of Section 36, T9S, R7E, an 830-acre lake would be created with a storage capacity of 11,000 acre-feet from a watershed of 3.9 square miles. Construction of this site would necessitate abandoning the county line highway and one connecting county road. The length of the dam would be extremely short due to a narrow valley between Cave Hill and Wild Cat Hill.

Five additional Saline County sites are suggested for investigation:

A dam constructed in the NW 1/4 of Section 3, T9S, R5E across the valley of Brushy Creek would create a 100-acre lake with a maximum depth of 20 feet.

A dam located in the southern half of Section 35, T8S, R5E on a tributary of Brushy Creek would create a 100-acre lake with a maximum depth of water of 40 feet.

A dam located in the NW 1/4 of Section 20, T7S, R6E across Long Branch (Rector Creek) would create a 160-acre lake with a maximum depth of 20 feet.

A dam located in the NE 1/4 of Section 20, T8S, R6E on a tributary of the Saline River would create a pool area of 100 acres and a maximum depth of 20 feet.

A dam located in the NE 1/4 of Section 19, T7S, R6E on Long Branch (Rector Creek) would create a 200-acre lake with a maximum depth of 15 feet.

Ten potential and eight existing reservoir sites are shown on the map of Saline County, Figure 18, and hydrologic data are summarized in Table 23. Data for existing reservoirs are summarized in Table 24.

TABLE 23
SALINE COUNTY, HYDROLOGIC DATA FOR POTENTIAL RESERVOIR SITES

Location	Watershed Area (Square Miles)	Spillway Elevation (Feet (MSL)	Depth of Water at Dam (Feet)	Pool Area (Acres)	Storage Capacity (Acre-Feet)	Storage Capacity (Million Gallons)	Mean Annual Runoff (Million Gallons)	Evaporation Loss per Year (Million Gallons)	Yield per Day* (Million Gallons)
Gassaway Creek NE 1/4 Sec. 2, T8S, R5E	4.1	430	27	260	2,340	762	1,069	150	1.2
South Fork, Saline River NE 1/4 Sec. 19, T10S, R5E	151.0	400	20	3140	20,933	6,821	39,366	1812	18.3
Little Saline River SE 1/4 Sec. 34, T10S, R5E	26.9	500	110	3300	121,000	39,428	7,013	1905	15.4
Battle Ford Creek SW 1/4 Sec. 28, T10S, R6E	9.3	460	90	510	15,300	4,986	2,425	294	4.9
Blackman Creek near NE Cor. Sec. 27, T10S, R6E	3.9	430	54	270	4,860	1,584	1,017	153	1.8
Spring Valley Creek near S. Line Sec. 24, T10S, R6E	4.7	440	60	290	5,800	1,900	1,225	167	2.1
Lockwood Hollow SW 1/4 Sec. 19, T10S, R7E	0.9	420	40	20	267	87	235	11	0.2
Sadler School Hollow SE 1/4 Sec. 19, T10S, R7E	1.3	460	60	38	760	248	339	21	0.4
Flatrock Hollow NW 1/4 Sec. 20, T10S, R7E	1.6	460	60	100	2,000	652	417	57	0.7
Horseshoe Hollow NE 1/4 Sec. 36, T9S, R7E	3.9	400	40	830	11,067	3,606	1,017	479	2.2

* 40-year recurrence interval.

TABLE 24
SALINE COUNTY, HYDROLOGIC DATA FOR EXISTING RESERVOIRS

Reservoir	Location	Watershed Sq. Mi.	Pool Area Acres	Capacity Mil. Gal.	Remarks
Carrier Mills	Sec. 35, T9S, R5E	2.5	5.0	5.0	Mine uses
Sahara Coal Co.	Sec. 20, T9S, R5E	Pumped in	115.0	200.0	Mine uses
Eldorado Reservoir	Sec. 13, T8S, R6E	3.1	135.0	350.0	Supply for Eldorado
Galatia	Sec. 11, T8S, R5E	Pumped in	6.4	23.0	Storage of water
Harrisburg City Res. 1	Secs. 3 & 10, T9S, R6E	Pumped in	35.0	151.7	Supply for Harrisburg
Harrisburg City Res. 2	Secs. 3 & 10, T9S, R6E	Pumped in	37.0	160.3	Supply for Harrisburg
New York Central Railroad	Sec. 3, T9S, R6E	0.02	5.5	10.0	Railroad uses
New Harrisburg	Sec. 7, T8S, R6E	5.4	350.0	900.0	Harrisburg water supply

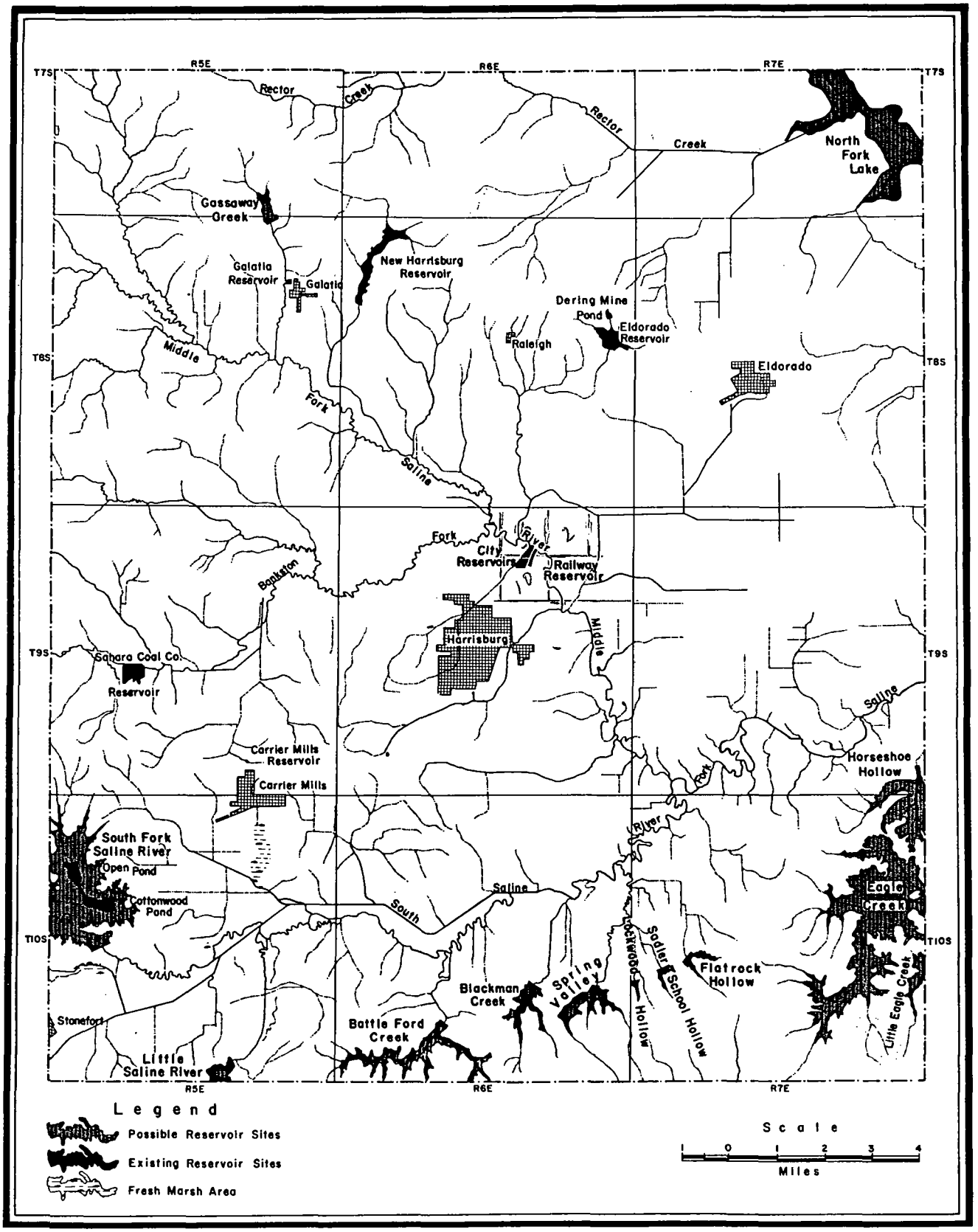

FIGURE 18 SALINE COUNTY

posits may have sufficient water-bearing capacity to warrant exploratory investigation.

In the uplands (Zone 3) of Pope County, water for farm and domestic purposes is obtained from shallow-dug wells or drilled into rock with yields of 3 to 5 gpm.

PULASKI COUNTY

The wells of Mounds and Mound City (Zone 1, Fig. 29) are drilled into rock and have reported yields of 600 and 350 gpm (Table 29) respectively. The village well at Karnak and the Chicago and Eastern Illinois Railroad well at Perks (Zone 2) have reported yields of 75 and 175 gpm (Table 29) respectively with specific capacities of 4 and 16 gpm per foot of drawdown.

Wells in Zone 3 are the shallow-dug type or drilled into rock and because of low yields they are adequate for farm and domestic uses only.

RANDOLPH COUNTY

The Water Survey has a record of one well in Randolph County (Zone 1, Fig. 29); however, physical characteristics in this part of Randolph County are similar to those in Zone 1 of Jackson County and may be regarded as adequate justification for exploratory investigations for medium to high capacity wells. The village well at Prairie du Rocher produces 80 gpm with a specific capacity of 38 gpm per foot of drawdown (Table 29).

Municipal wells in (Zone 3, Fig. 29) Randolph County have yields of 50 to 100 gpm (Table 29) but the specific capacities are less than 1 gpm per foot of drawdown.

SALINE COUNTY

The Water Survey has no record of wells in Saline County, other than those of farm and domestic supplies which are either shallow dug or drilled into rock and have low capacities of 2 to 5 gpm.

UNION COUNTY

There are high capacity wells in the alluvial plain of the Mississippi River along the westerly side of Union County (Zone 1, Fig. 29). The new well of Anna State Hospital (Table 29), east of Ware, is 70 feet deep and reported to yield at a rate of 535 gpm. The new wells of the State Game Refuge (Table 29), located south of Ware, are reported to be 80 to 92 feet in depth and to yield at a rate of 1000 gpm. The specific capacities of these wells were calculated to vary from 48 to 77 gpm per foot of drawdown.

Municipal wells at Cobden and Dongola (Zone 3) are respectively 226 and 301 feet in depth (Table 29) and reported to yield 190 and 110 gpm but the specific capacities are low.

WHITE COUNTY

The wells which supply the city of Grayville (Wabash County, Table 29) are located in the Wabash River bottoms (Zone 1, Fig. 29). These wells are 70 to 73 feet in depth and are reported to have yield rates of 175 to 370 gpm. Specific capacities are reported from 14 to 100 gpm per foot of drawdown.

A new well was reported in 1955 to have been drilled for Crossville (Zone 2) and located about 3 miles east in the Fox River flat. No production test is available, but it is reported the well yields an adequate supply for the village.

There are reports of water-bearing sand and gravel deposits in the Skillet Fork and upper portion of the Little Wabash River valley flats (Zone 2), but the Water Survey has no record of yield tests from these wells.

WILLIAMSON COUNTY

The Water Survey has no record of high capacity wells in Williamson County (Zone 3). The Creal Springs well (Table 29) was reported to yield 25 gpm with a drawdown of 80 feet or a specific capacity of 0.3 gpm per foot of drawdown. There are two 148 foot wells on the west side of Little Grassy Lake which are equipped with 25 gpm pumps. The water is reported to be hard and to contain an appreciable iron content.